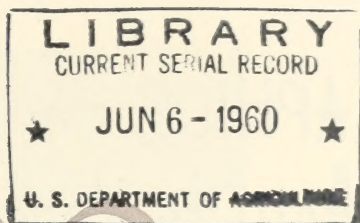


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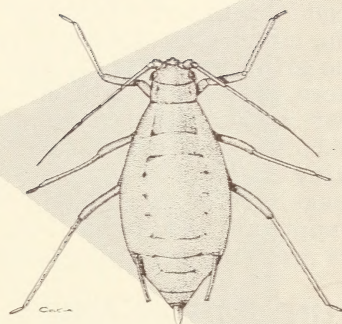


APHIDS

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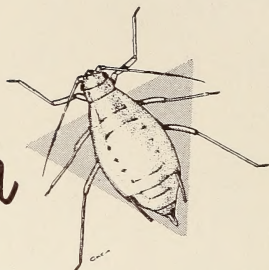
how to
control them



LEAFLET NO. 405

UNITED STATES DEPARTMENT OF AGRICULTURE

APHIDS on tobacco how to control them



By F. R. LAWSON and F. S. CHAMBERLIN, Entomology Research Division,
Agricultural Research Service

Aphids are pests of tobacco wherever the crop is grown in the United States. They injure the growing tobacco leaves and may spread tobacco virus diseases.

The aphid that attacks tobacco is the green peach aphid.¹ Among tobacco growers it is commonly known as the tobacco aphid or tobacco louse. It is a soft-bodied, sucking insect about the size of a cabbage seed. It can be controlled by applying insecticides or, in some areas, by cultural practices.

LIFE CYCLE OF APHIDS

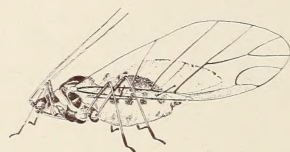
In Southern States

In the Southern States the aphids are nearly all females. The adults deposit their young, which

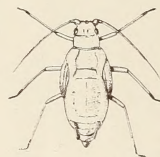
females. The adults and nymphs of the wingless form look alike.

The other nymphs develop into blackish, winged adults.

Successive generations of females, mainly wingless, are pro-

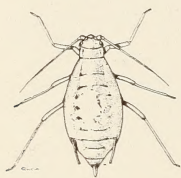


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Green peach aphid, winged form: Above, adult; below, nymph.



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Green peach aphid, wingless form: Nymph, almost grown.

are called nymphs, on various host plants. Most of the nymphs develop into green, wingless adults, which in turn produce another generation of wingless

duced throughout the year. This pattern of development is prevalent as far north as Tennessee and Maryland.

The host plants in the fall, winter, and early spring are cabbage, collard, turnip, wild mustards, and dock. In the spring, winged aphids fly to tobacco.

In Colder Climates

In the colder climates, a generation of males and egg-laying females develops in the fall. The eggs are laid mostly on peach, wild plum, and wild cherry trees;

¹ *Myzus persicae* (Sulz.).



BN-2077

Foreground, shade-grown tobacco stunted by aphid feeding; background, tobacco protected by insecticides.

they are green at first but soon turn shiny black. It is only in the egg stage that the aphids survive subzero temperatures. The eggs hatch in the spring. Usually, the second or third spring generation infests tobacco.

DAMAGE TO TOBACCO

Aphids damage the tobacco plant by sucking the juices from the leaves. When aphids are abundant the plants become stunted. Leaves from these plants are thin and lifeless when cured. A severely damaged leaf may die or may ripen prematurely.

Aphids contaminate tobacco by depositing cast skins and an excretion, known as honeydew, on the leaves. Honeydew causes the leaves to stick together, and it cannot be removed from the harvested leaves without damaging them. It mildews in wet weather and gives the leaves a blackish appearance.

Aphid damage quickly ruins a cigar-wrapper tobacco crop, because imperfect leaves cannot be used as wrappers. Other types of tobacco usually are not ruined, but their quality and yield are reduced. On types of tobacco that are harvested by cutting the

whole plant, such as Maryland, the yield and quality may be reduced by premature ripening of the lower leaves.

INFESTATIONS

How They Start

Aphid infestations in tobacco may start in the plant bed or in the field, depending on the condition of the winter and spring host plants.

In the Connecticut River Valley area, aphids normally spend the winter in the egg stage. During the spring season winged forms are produced and fly to other food plants. They may infest tobacco plant beds and fields.

In Tennessee and Kentucky, few aphids survive the winter. Plant beds of burley and dark fire-cured tobaccos usually are not infested by aphids from the local winter host plants, but they may be infested lightly in May by winged aphids from other areas. Field infestations early in the season are light also, and the aphids do little damage before the plants are topped.

In central and northern North Carolina and in southern Virginia, most of the aphids spend the fall and winter on garden patches of collards and turnips. A plant bed near these patches usually will be infested. Under the cover, where it is warm, the aphids multiply rapidly. They are carried to the tobacco field on the seedlings. Most of the heavy infestations in the field are started in this way.

In South Carolina and southern North Carolina, aphids winter on garden patches, as they do in central and northern North Carolina and in southern Virginia, and they start some plant bed infestations. In these areas, however, most of the aphids that infest tobacco come from extensive

growths of wild mustard in grain and clover fields and in pastures. Large numbers of aphids feed on the mustard in late winter and spring. The mustard matures about the time that tobacco is set and many tobacco fields are infested by aphids flying from the mustard, especially when tobacco is planted near mustard.

In Florida and Georgia, both plant beds and fields may be heavily infested by aphids flying from fields of wild mustard or cultivated greens.

How They Develop

Aphids reproduce quickly on young tobacco in the field, especially in the shade. They are most numerous on the underside of the lower leaves of tobacco plants, but a great many may be found also on the youngest leaves near the tip of the plant. When they are abundant, they cover almost all the leaves.

In Virginia, the Carolinas, Georgia, and Florida, they increase rapidly for a month or more in the field, but they do not thrive after hot weather begins. When the temperature reaches 90° F. 3 or 4 days in succession, large numbers of aphids die and turn black. Some may remain in shady spots, but few are seen elsewhere unless the weather becomes cool. When aphids infest the plant beds early or where large numbers of aphids fly into tobacco from mustard fields, they may become abundant enough to injure the plants before hot weather begins. Unshaded fields that are lightly infested early in the season are not likely to be injured unless weather conditions are especially favorable for aphid development. On cigar-wrapper tobacco, which is grown in the shade, aphids increase so rapidly that damage may occur at any time.



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A leaf of flue-cured tobacco damaged by aphids. Part of the leaf is black from mildew growing on the honeydew excretion.

In Tennessee, Maryland, and the Northern States, the aphids may increase all summer, and most of the damage occurs late in the season. In warm weather they may reproduce so rapidly on the

lower leaves that severe damage occurs before the grower notices them. When the temperature is higher than 95° F. for several days, many aphids die, and danger of severe injury is reduced.

CULTURAL PRACTICES

Many of the worst aphid infestations on tobacco are started in the plant beds by aphids moving from nearby patches of collard, turnip, mustard, or dock. Beds should be located a safe distance from such sources of aphids, or the winter host plants should be destroyed before the tobacco germinates. If this is not done the beds may be reinfested even if they are treated with insecticides. The removal of winter hosts is an effective way to prevent heavy infestations in the field.

The tobacco field should be free of weeds before the plants are set.

INSECTICIDE TREATMENT

Malathion, thiodan and parathion are effective insecticides for controlling aphids. Malathion and thiodan are less hazardous to apply. The insecticides can be used as dusts or sprays.

Selection

DUSTS

If you prefer dusts, buy a ready-to-use dust containing 4 percent of malathion or thiodan or 1 percent of parathion.

SPRAYS

For hand equipment, which is used in plant beds, and high-gallonage (50 to 100 gallons per acre) equipment, which is used in the field, buy an emulsifiable concentrate or a wettable powder that contains malathion or parathion. The amount to mix with 100 gallons of water is shown below.

MALATHION—2 pints of 50-percent emulsifiable concentrate or 4 pounds of 25-percent wettable powder.

PARATHION—1 pint of 25-percent emulsifiable concentrate or 1 pound of 15-percent wettable powder.

For aircraft sprayers or other low-gallonage (1 to 5 gallons per acre) equipment, buy an emulsifiable concentrate that contains malathion or parathion. Wettable powders are not suitable; they tend to clog the nozzles. Mix the emulsifiable concentrate with 1 to 5 gallons of water. (The amount of water to use depends on the capacity of the equipment.) Use an amount of the concentrate that will give $\frac{1}{2}$ pound of parathion (actual) or 1 pound of malathion (actual) per acre.

Application

The insecticide should be applied to the plants thoroughly but lightly. The dosage depends on the size of the plants. Quantities larger than those recommended increase the cost of treatment and the hazard of excess residues on the tobacco.

If you use a spray, apply it immediately after it has been mixed.

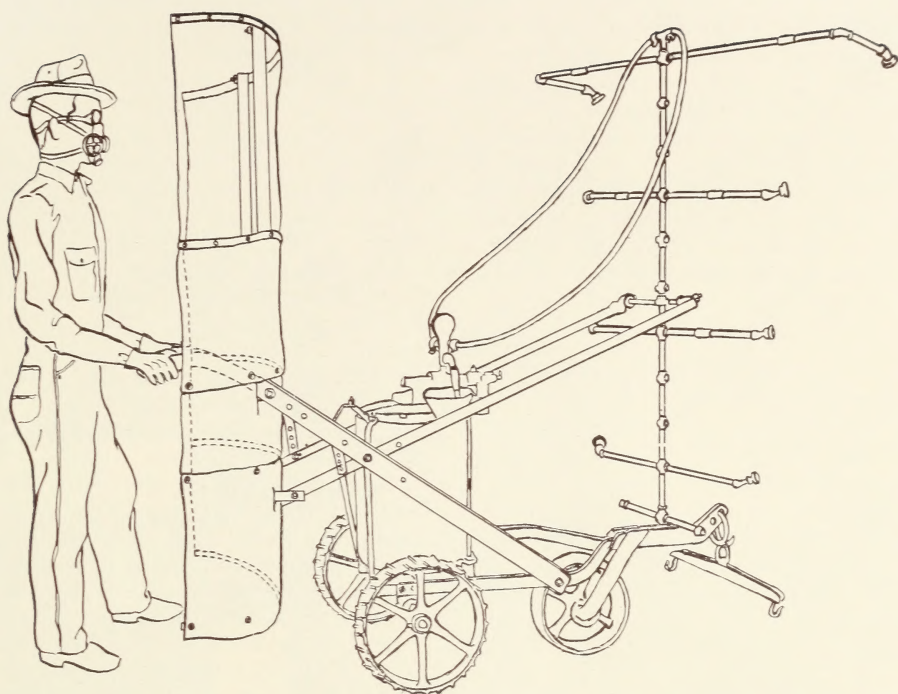
IN PLANT BEDS

All cigar-wrapper tobacco plant beds should be treated several times with an insecticide, whether or not aphids are found. Other tobacco plant beds should be inspected from time to time and treated as needed. It is also a good plan to treat any infested beds a few days before the plants are transplanted to the field.

The rate of application for dust is 1 pound per 100 square yards; for spray, 5 gallons per 100 square yards. You can apply dust without removing the plant bed cover, provided the cover is dry and is not touching the plants.

IN THE FIELD

Cigar-wrapper tobacco plants should be treated in the field once a week for the first 6 weeks. As the tobacco matures, it should be searched often for aphids. Small



BN-2078

Horse-drawn traction sprayer equipped with a protective shield. Operator must wear a mask and protective clothing when applying parathion.

outbreaks may be spot treated with a hand duster. During the last part of the growing season this tobacco should be treated by aircraft.

The plants of other tobaccos should be inspected carefully before they are a foot high. If only scattered aphids are found, treatment may not be necessary. If the smallest leaves of numerous plants are infested, an insecticide should be applied. Plants growing in the shade may need treatment when those in the sun do not. The timely use of insecticides in the plant bed and on young plants in the field will reduce the chances of severe infestations later in the season.

If ground equipment is used, the rates of application are as follows:

DUST—8 to 15 pounds per acre on small plants; 20 to 30 pounds per acre on large plants.

SPRAY—50 to 60 gallons per acre on small plants; 75 to 100 gallons per acre on large plants.

If aircraft is used, the rates of application are as follows:

DUST—20 to 30 pounds per acre.

SPRAY—1 to 5 gallons per acre.



Control of Other Insects Occurring With Aphids

The tobacco hornworm, the tomato hornworm, budworms, flea beetles, and climbing cutworms may occur with aphids in the

same tobacco field. It is not possible to control all these insects with any single insecticide, but two or more insecticides may be included in the same dust or spray. TDE, DDT, or endrin will control budworms and climbing cutworms. TDE or endrin will also control hornworms, and DDT or endrin will control flea beetles.

SPRAYS

Combination sprays can be prepared by adding to the parathion or malathion sprays described on page 6 a sufficient amount of an emulsifiable concentrate of TDE, DDT, or endrin to make 1 pound of TDE, $\frac{1}{2}$ pound of DDT, or $\frac{1}{5}$ pound of endrin per acre.

DUSTS

Effective combination dusts should contain—

1 percent of parathion or 4 percent of malathion or thiodan; and

10 percent of TDE or 10 percent of DDT.

If a combination dust is applied to the buds of the plants, it should be used lightly because a heavy dosage is likely to cause plant damage, especially if the plants are wet.

PRECAUTIONS

The insecticides mentioned in this leaflet are poisons. Store them where children and animals cannot reach them. Handle them with care. Follow the directions and heed all precautions on the container label. Use the recom-

mended protective equipment to avoid personal exposure.

Do not apply malathion within 3 days or thiodan within 5 days before a priming or cutting.

Parathion and endrin are especially dangerous, and may cause death when inhaled, absorbed through the skin, or swallowed. They should be used only by trained operators who will assume full responsibility for safe use and comply with all the precautions prescribed by the manufacturer. Do not apply parathion or endrin within 5 days before priming or 15 days before cutting.

Avoid getting parathion or endrin on the skin. Keep them away from the eyes, nose, and mouth. Wear a respirator of a type that has been tested by the U.S. Department of Agriculture and found to be satisfactory for protection against the particular insecticides you are using. Wear rubber gloves and protective clothing. When using a hand duster, arrange the discharge tube so that it extends backward behind you. Watch the wind direction and stay out of the dust cloud. If you use a walking traction sprayer, use one that is equipped with a protective shield. Wash your hands and face thoroughly before eating or smoking. Bathe after working with these materials and wash your clothing before wearing it again.

If you must transplant or otherwise handle plants within 5 days after treatment with endrin or parathion, protect your skin by wearing clean, dry, cotton gloves or a good grade of rubber gloves and tightly woven clothing.

Washington, D.C.

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